



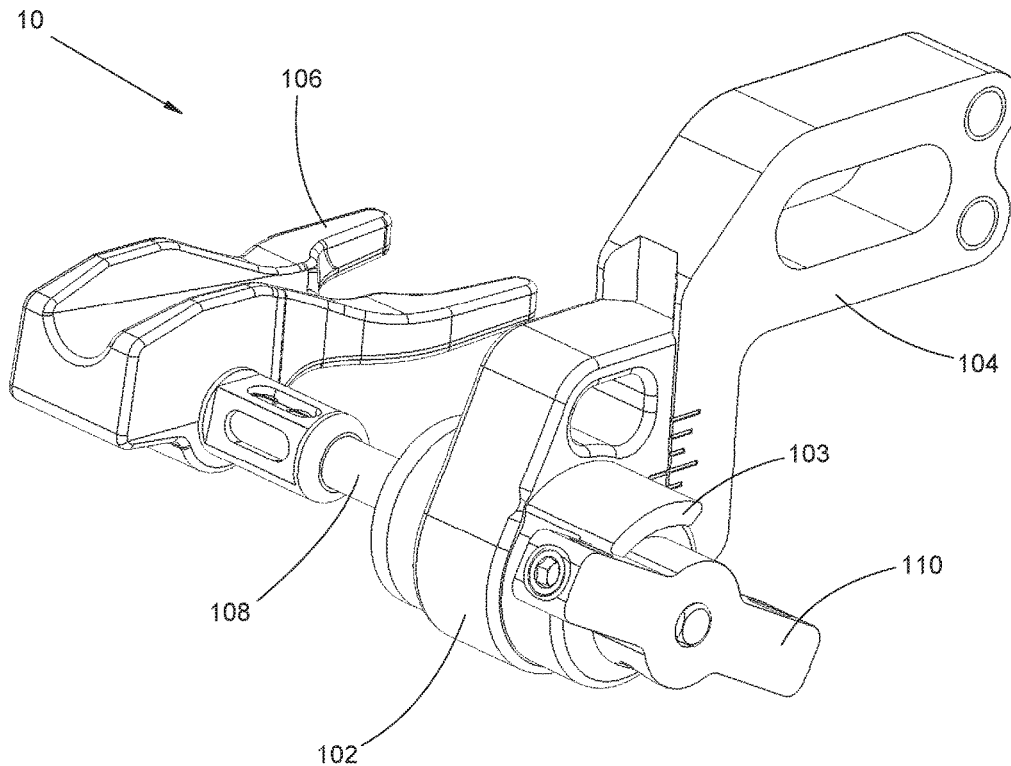
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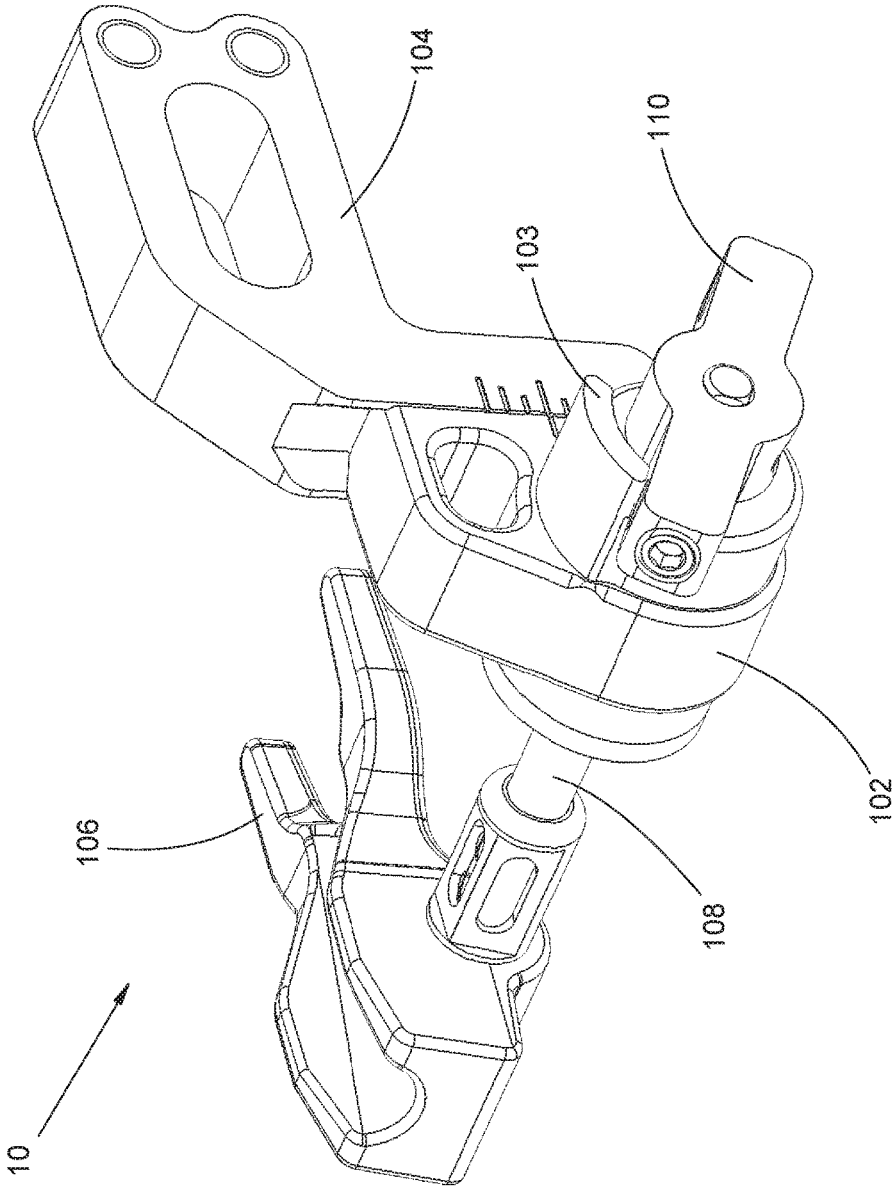
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Eacker(10) **Pub. No.: US 2017/0191788 A1**(43) **Pub. Date: Jul. 6, 2017**(54) **ARROW REST ASSEMBLY WITH
BIDIRECTIONAL BIAS TORQUE**(52) **U.S. Cl.**CPC *F41B 5/1453* (2013.01); *F41B 5/10*
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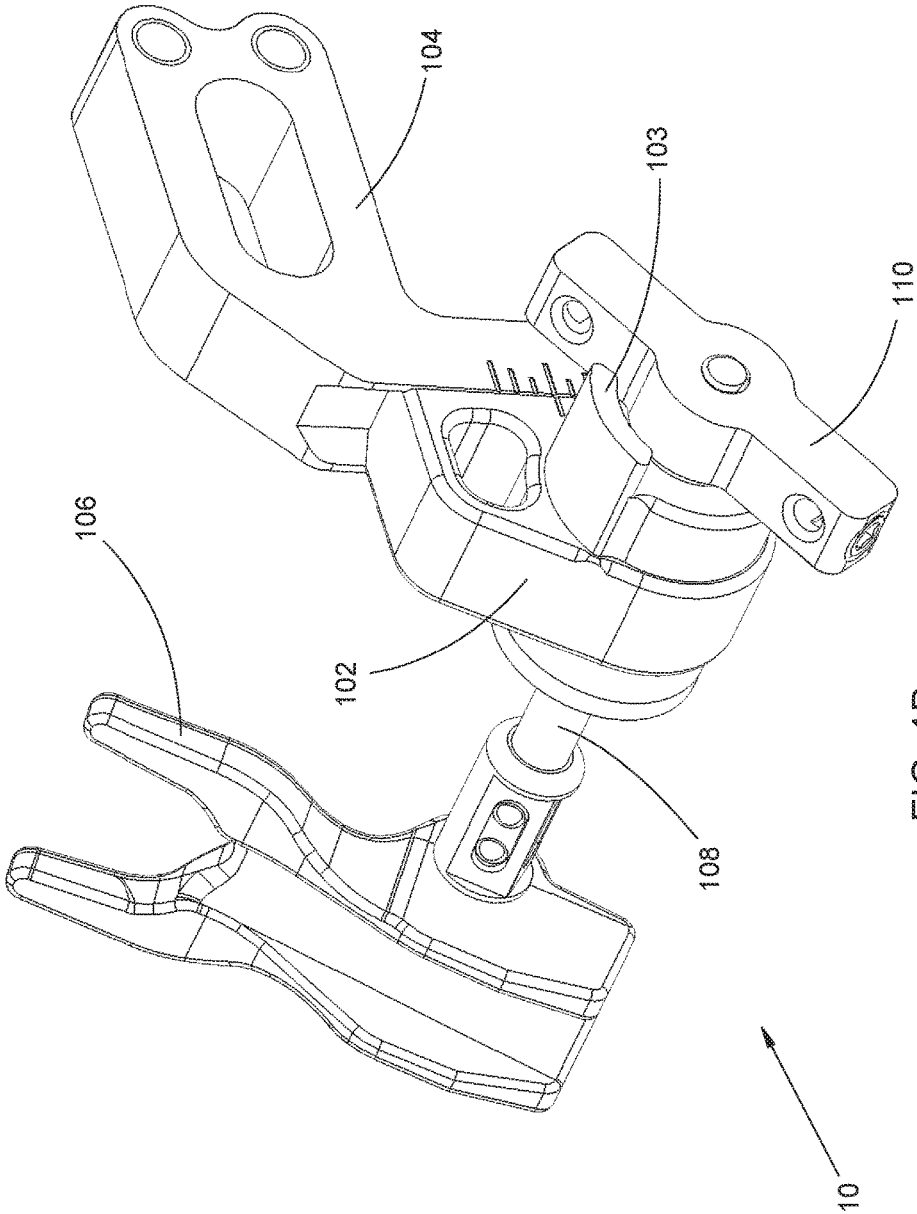
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ABSTRACT

An arrow rest assembly includes a body, shaft, bidirectional bias mechanism, launcher, and rotation stop. The shaft rotates about a transverse axis and the launcher and rotation stop are secured to the shaft. The bidirectional bias mechanism provides a bias torque that opposes rotation of the shaft in both directions away from a single shaft reference orientation. The arrow rest assembly can be structurally arranged to be cable-driven or limb-driven. If the launcher can be removably secured in each of first and second launcher orientations, then the arrow rest assembly can be readily converted between the limb- and cable-driven arrangements.







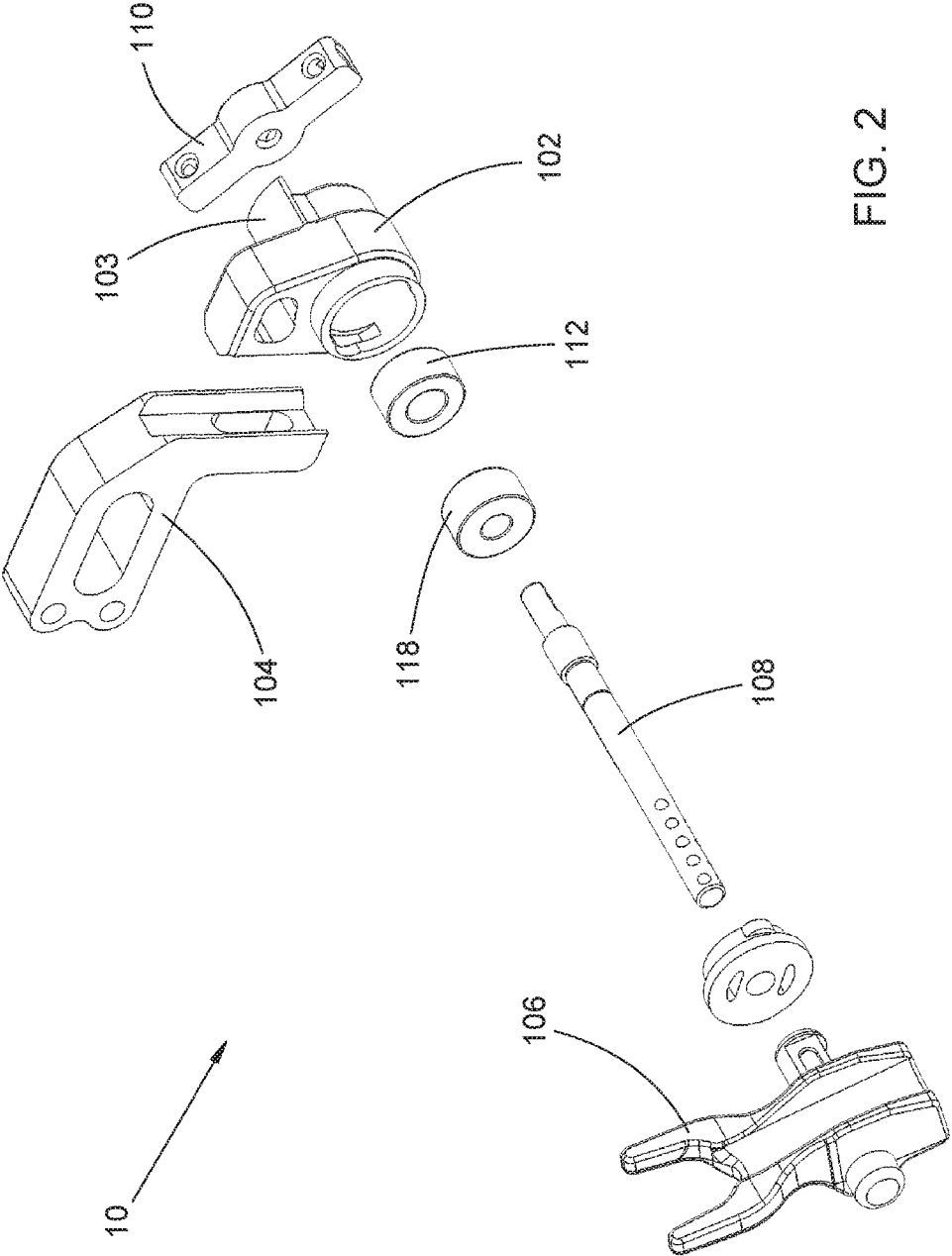


FIG. 2

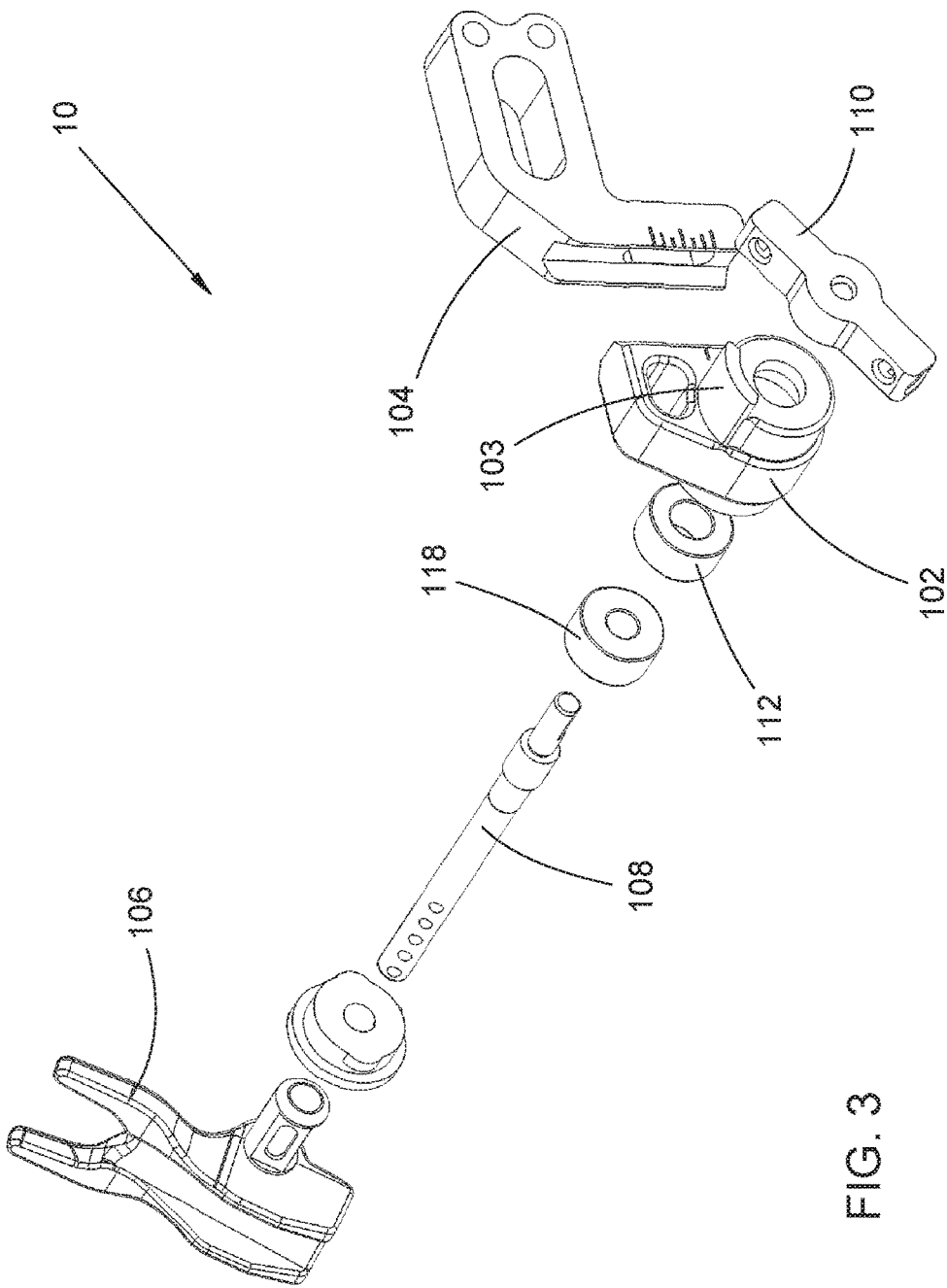
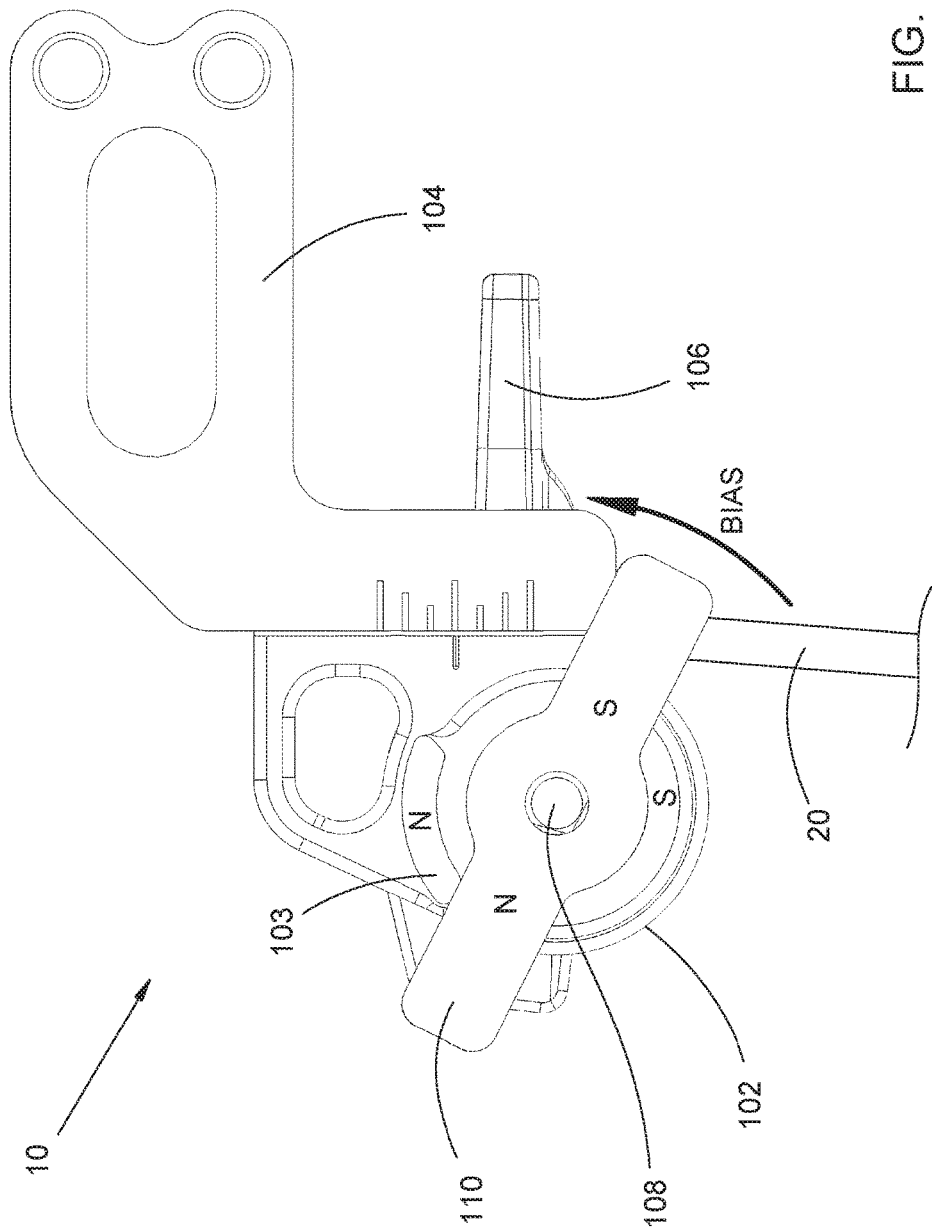


FIG. 3



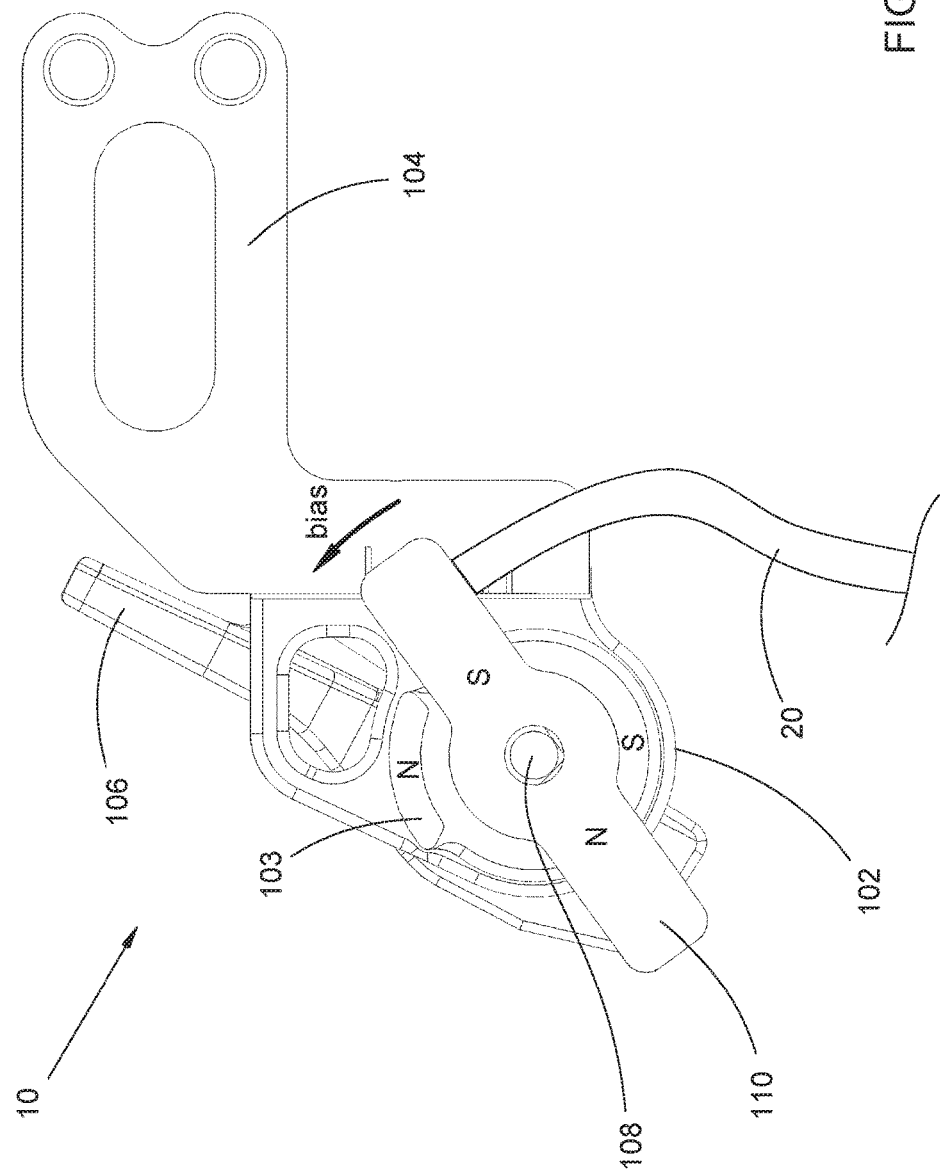


FIG. 4B

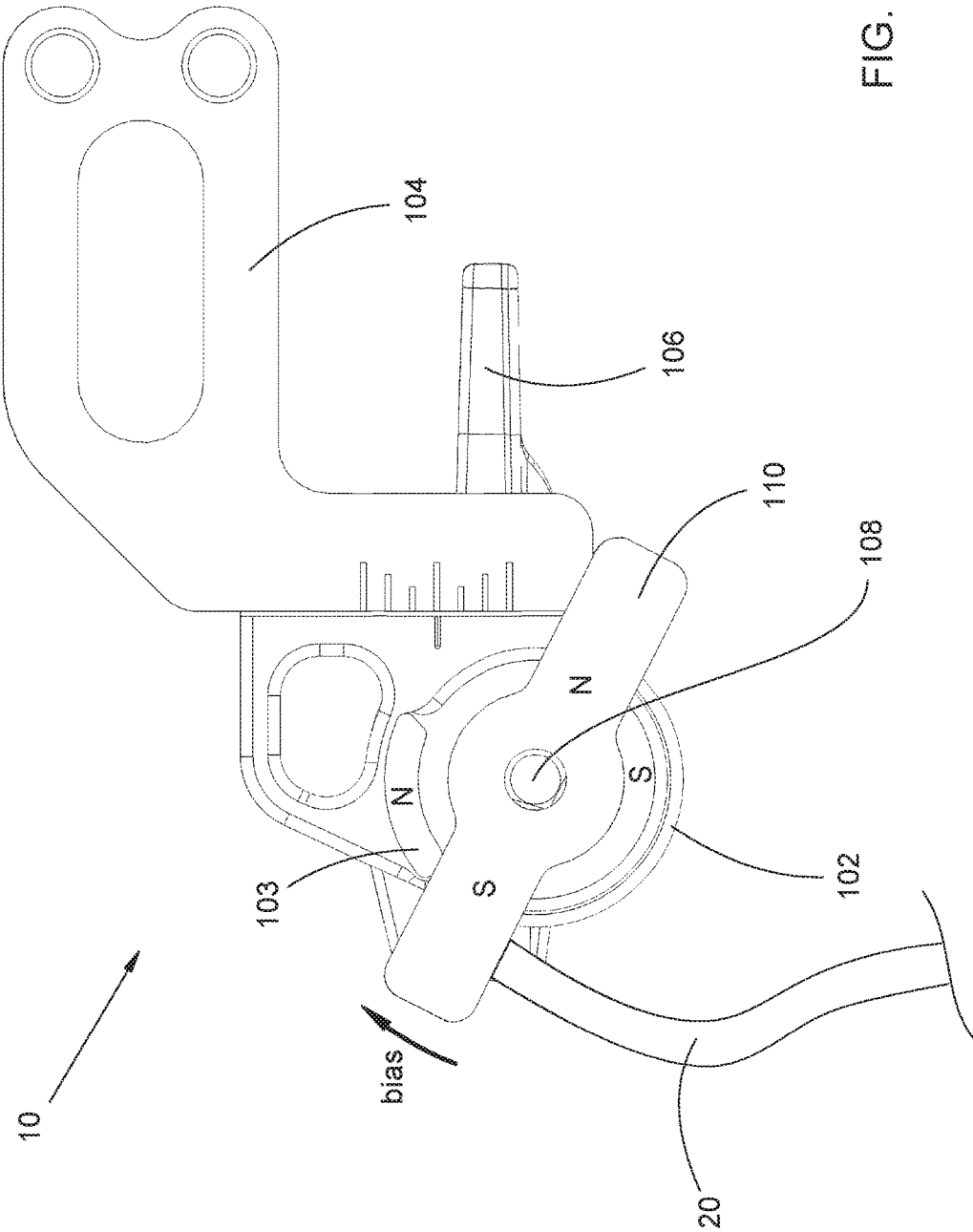
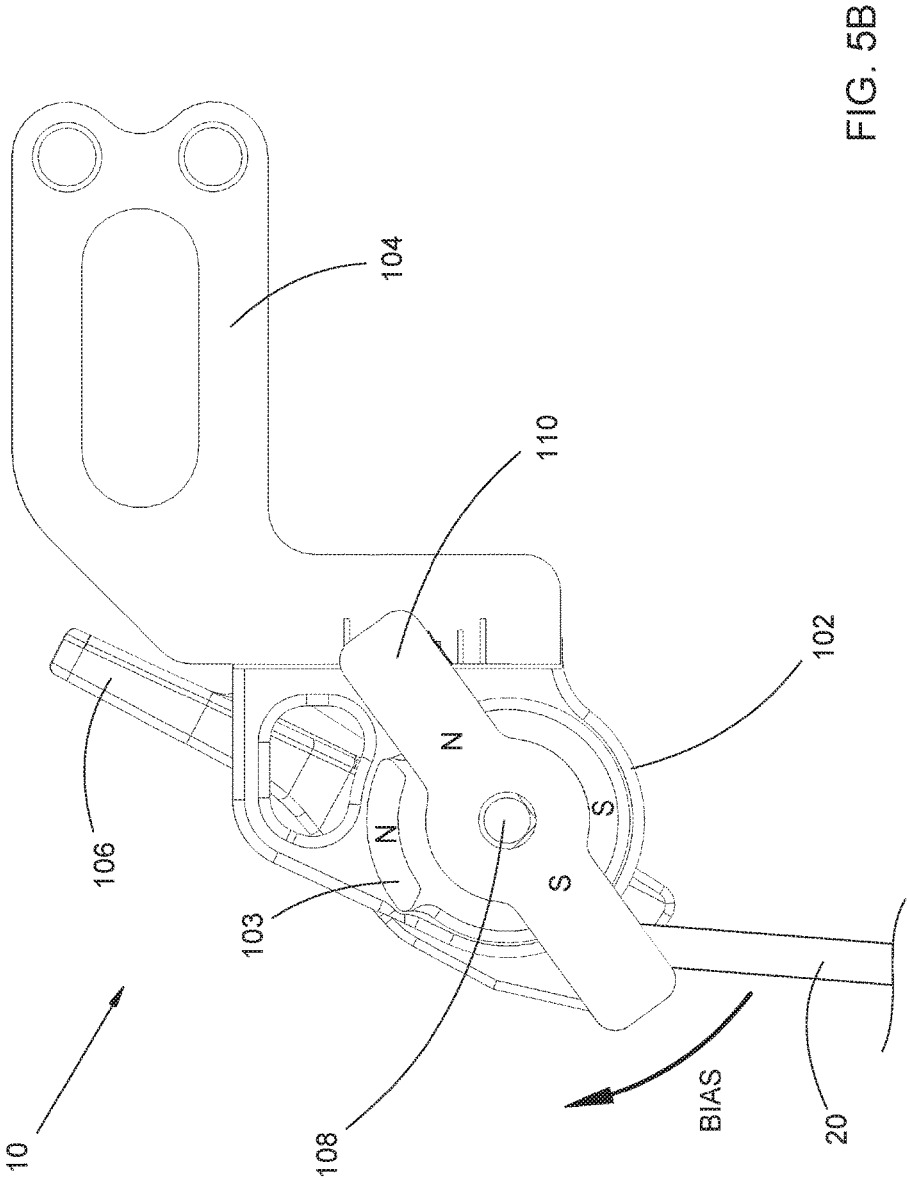


FIG. 5A



ARROW REST ASSEMBLY WITH BIDIRECTIONAL BIAS TORQUE

FIELD OF THE INVENTION

[0001] The field of the present invention relates to arrow rests for archery bows. In particular, an arrow rest assembly and associated methods are described herein that employ a bidirectional bias torque.

BACKGROUND

[0002] An arrow rest is a structural member attached to an archery bow, typically on the bow's riser or handle, that is arranged to support the shaft of the arrow when the bow is drawn or shot. Such support of the shaft can typically enable the archer to shoot more accurately. A few previous examples of arrow rest assemblies are disclosed in:

[0003] U.S. Pat. No. 4,473,058 entitled "Arrow rest" issued Sep. 25, 1984 to Terry;

[0004] U.S. Pat. No. 4,548,189 entitled "Arrow rests used in archery" issued Oct. 22, 1985 to Pietraszek et al;

[0005] U.S. Pat. No. 4,676,220 entitled "Arrow rest" issued Jun. 30, 1987 to Pietraszek;

[0006] U.S. Pat. No. 5,503,136 entitled "Arrow rest with retracting arm" issued Apr. 2, 1996 to Tone;

[0007] U.S. Pat. No. 6,561,174 entitled "Arrow rest" issued May 13, 2003 to Afshari;

[0008] U.S. Pat. No. 6,688,297 entitled "Magnetic arrow rest biasing device" issued Feb. 10, 2004 to Clague;

[0009] U.S. Pat. No. 7,963,279 entitled "Drop-away arrow rest" issued Jun. 21, 2011 to Harwath et al; and

[0010] U.S. Pat. No. 8,544,457 entitled "Archery rest system" issued Oct. 1, 2013 to Munsell et al.

[0011] Many previous examples of arrow rest assemblies employ a "fall-away" design wherein the arrow rest (also referred to as the launcher) is arranged to be in a launcher-up position with the bow drawn and then to move to a launcher-down position after the bowstring is released and the bow returns to its brace configuration. In the launcher-up position, the launcher supports the front end of the nocked arrow with the bow drawn; in the launcher-down position, the launcher can allow the arrow's fletching to pass unimpeded (or at least less impeded) when the bowstring of the drawn bow is released to shoot the arrow. Fall-away arrow rest assemblies fall into "limb-driven" or "cable-driven" categories.

[0012] In a limb-driven type of arrow rest assembly, the launcher is biased toward the launcher-up position by a bias mechanism, e.g., a spring or an arrangement of two or more magnets. A coupling cable or tether is connected to one of the bow limbs and to the arrow rest assembly and arranged, with the bow at brace, so that the coupling cable is tensioned and holds the launcher in the launcher-down position against the bias force. Upon drawing the bow, the coupling cable goes slack (due to the bending of the bow limb toward the arrow rest assembly) and the bias force moves the launcher into the launcher-up position to support the arrow. Upon releasing the bowstring to shoot the arrow, the bow limb returns to its brace configuration, reapplying tension to the coupling cable and pulling the launcher back to the launcher-down position against the bias force. Instead of being connected to the bow limb, alternatively the coupling cable

can be connected to a segment of a cable of the compound bow that moves toward the arrow rest assembly as the bow is drawn (e.g., a lower segment of a let-out cable of a single-cam compound bow). Such an arrangement behaves the same as if the coupling cable were connected to the bow limb, and shall also be referred to as "limb-driven."

[0013] In a cable-driven type of arrow rest assembly, the launcher is biased toward the launcher-down position by the bias mechanism. The coupling cable is connected to a segment of a bow cable that moves away from the arrow rest assembly as the bow is drawn (e.g., a lower segment of a power cable of a single-cam bow). At brace the coupling cable is slack and the bias force holds the launcher in the launcher-down position. As the bow is drawn, movement of the bow cable tensions the coupling cable and moves the launcher to the launcher-up position against the bias force. Upon releasing the bow string to shoot the arrow, movement of the bow cable allows the coupling cable to go slack, which in turn allows the launcher to return to the launcher-down position in response to the bias force.

SUMMARY

[0014] An arrow rest assembly for a compound archery bow comprises a body, a shaft, a bidirectional bias mechanism, a launcher, and a rotation stop. The shaft is engaged with the body so as to rotate about an axis that, with the arrow rest assembly secured to the riser of the archery bow, is substantially perpendicular to a shooting plane defined by the archery bow. The bidirectional bias mechanism is structurally arranged so as to provide a bias torque that opposes rotation of the shaft in both directions away from a single, substantially fixed shaft reference orientation relative to the body. The launcher and the rotation stop are substantially non-rotatably secured to the shaft.

[0015] The launcher can be arranged so as to be removably, substantially non-rotatably secured to the shaft in each one of first and second launcher orientations relative to the shaft. With the launcher removably secured to the shaft in the first launcher orientation, the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in a launcher-up position, and (ii) rotation of the shaft, away from the reference orientation in a first direction against the bias torque, moves the launcher from the launcher-up position to a launcher-down position. A coupling cable can be connected to a limb of the archery bow or to a segment of a cable of the archery bow that moves toward the arrow rest assembly when the bow is drawn, and coupled to the shaft so as to link rotation of the shaft to movement of the limb or movement of the cable segment that moves toward the arrow rest assembly when the bow is drawn. The arrow rest assembly can be further structurally arranged so that: (i) with the bow at brace, tension on the coupling cable holds the shaft rotated in the first direction against the bias torque with the launcher in the launcher-down position; and (ii) with the bow drawn, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position. The arrow rest assembly is thus in a so-called limb-driven arrangement.

[0016] With the launcher removably secured to the shaft in the second launcher orientation, the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position, and (ii) rotation of the shaft, away

from the reference orientation in a second direction opposite the first direction and against the bias torque, moves the launcher from the launcher-down position to the launcher-up position. A coupling cable can be connected to a segment of a cable of the archery bow that moves away from the arrow rest assembly when the bow is drawn, and coupled to the shaft so as to link rotation of the shaft to movement of the cable segment that moves away from the arrow rest assembly when the bow is drawn. The arrow rest assembly can be further structurally arranged so that: (i) with the bow at brace, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position; and (ii) with the bow drawn, tension on the coupling cable holds the shaft rotated in the second direction against the bias torque with the launcher in the launcher-up position. The arrow rest assembly is thus in a so-called cable-driven arrangement.

[0017] With the launcher arranged so as to be removably secured to the shaft in each one of the first and second launcher orientations relative to the shaft, the arrow rest assembly can be readily converted between the limb-driven and cable-driven arrangements by: (A) moving the launcher between the first and second launcher orientations; (B) moving the connection of the coupling cable between the limb or cable segment that moves toward the arrow rest assembly when the bow is drawn and the cable segment that moves away from the arrow rest assembly when the bow is drawn; and (C) arranging, or verifying the arrangement of, coupling of the coupling cable to the shaft so as to link rotation of the shaft to the desired movement of the corresponding cable segment or limb.

[0018] Objects and advantages pertaining to arrow rest assemblies may become apparent upon referring to the example embodiments illustrated in the drawings and disclosed in the following written description or appended claims.

[0019] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1A is an isometric view of an arrow rest assembly with a launcher in a launcher-down position.

[0021] FIG. 1B is an isometric view of the arrow rest assembly with the launcher in a launcher-up position.

[0022] FIGS. 2 and 3 are exploded views of the arrow rest assembly.

[0023] FIG. 4A is a side view of an arrow rest assembly in a limb-driven arrangement with a bow at brace and with the launcher in the launcher-down position.

[0024] FIG. 4B is a side view of an arrow rest assembly in a limb-driven arrangement with the bow drawn and with the launcher in the launcher-up position.

[0025] FIG. 5A is a side view of an arrow rest assembly in a cable-driven arrangement with a bow at brace and with the launcher in the launcher-down position.

[0026] FIG. 5B is a side view of an arrow rest assembly in a cable-driven arrangement with the bow drawn and with the launcher in the launcher-up position.

[0027] The embodiments depicted are shown only schematically: all features may not be shown in full detail or in

proper proportion, certain features or structures may be exaggerated relative to others for clarity, and the drawings should not be regarded as being to scale. The embodiments shown are only examples: they should not be construed as limiting the scope of the present disclosure or appended claims.

DETAILED DESCRIPTION OF EMBODIMENTS

[0028] An example of an arrow rest assembly **10** for archery bow is shown in FIGS. 1A/1B, 2, 3, 4A/4B, and 5A/5B. The arrow rest assembly is depicted schematically in a limb-driven arrangement with the bow at brace and drawn (FIGS. 4A and 4B, respectively) and in a cable-driven arrangement with the bow at brace and drawn (FIGS. 5A and 5B, respectively). The arrow rest assembly **10** comprises a body **102**, a shaft **108**, a bidirectional bias mechanism, a launcher **106**, and a rotation stop **110**. The body **102** can be secured directly to a riser of the archery bow, or a mounting bracket **104** can be employed that is structurally arranged so as to secure the arrow rest assembly **10** in any suitable way to the riser of the archery bow. If needed or desired, the mounting bracket **104** can be further arranged so as to enable adjustment of a vertical position of the arrow rest assembly relative to the riser of the archery bow.

[0029] The shaft **108** is engaged with the body **102** so as to rotate about an axis that, with the arrow rest assembly **10** secured to the riser of the archery bow, is substantially perpendicular to a shooting plane defined by the archery bow (i.e., a plane substantially defined by the bowstring travel as the bow is drawn and then shot). A launcher **106** of any suitable type or arrangement (i.e., typically a two-pronged member that supports the front end of the nocked arrow when the bow is drawn) is structurally arranged so as to be removably, substantially non-rotatably secured to the shaft **108** in each one of first and second launcher orientations relative to the shaft **108**. A rotation stop **110** is also substantially non-rotatably secured to the shaft **108**.

[0030] A bidirectional bias mechanism is structurally arranged so as to provide a bias torque that opposes rotation of the shaft **108**, in either direction, away from a single, substantially fixed shaft reference orientation relative to the body **102**. Put another way, with the shaft rotated to the reference orientation, the bias mechanism exerts negligible torque on the shaft; rotation of the shaft away from the reference orientation results in exertion of a restoring bias torque that opposes that rotation. In the examples of FIGS. 4A through 5B, the shaft reference orientation corresponds to the “N” and “S” labels on the rotation stop **110** being aligned substantially antiparallel to the “N” and “S” labels on the body **102**, i.e., “N” on the rotation stop **110** being aligned with the “S” on the body **102** and the “S” on the rotation stop **110** aligned with the “N” on the body **102**. Any suitable mechanism can be employed for providing the bidirectional bias torque; several examples are described further below.

[0031] FIGS. 4A and 4B depict the arrow rest assembly **10** in a limb-driven arrangement. The launcher **106** substantially is substantially non-rotatably secured to the shaft **108** in the first launcher orientation. Engagement of the rotation stop **110** and the body **102** (via a first end of arcuate projection **103** in this example) holds the shaft **108** with the launcher **106** in a launcher-up position (FIG. 4B). The rotation stop **110** holds the shaft **108** in position against the bias torque in this example (i.e., the launcher **106** is pre-

loaded in the launcher-up position; torque labelled “bias”), but that need not be the case; in another example the launcher-up position can correspond, e.g., to the shaft reference orientation where there would be negligible torque. Rotation of the shaft **108**, away from the reference orientation in a first direction (clockwise in FIGS. **4A** and **4B**) against the bias torque (labelled “BIAS”), moves the launcher **106** from the launcher-up position (FIG. **4B**) to a launcher-down position (FIG. **4A**). In some examples, the rotation stop **110** can be further arranged so that engagement of the rotation stop **110** and the body **102** (via the second end of arcuate projection **103** in this example; FIG. **4A**) substantially prevents further rotation and movement of the launcher **106** beyond the launcher-down position.

[0032] FIGS. **5A** and **5B** depict the arrow rest assembly **10** in a cable-driven arrangement. The launcher **106** is substantially non-rotatably secured to the shaft **108** in the second launcher orientation. Engagement of the rotation stop **110** and the body **102** (via the second end of arcuate projection **103** in this example) holds the shaft **108** with the launcher **106** in a launcher-down position (FIG. **5A**). The rotation stop **110** holds the shaft **108** in position against the bias torque in this example (i.e., the launcher **106** is pre-loaded in the launcher-down position; torque labelled “bias”), but that need not be the case; in another example the launcher-down position can correspond, e.g. to the shaft reference orientation where there would be negligible torque. Rotation of the shaft **108**, away from the reference orientation in a second direction (counterclockwise in FIGS. **5A** and **5B**) against the bias torque (labeled “BIAS”), moves the launcher **106** from the launcher-down position (FIG. **5A**) to a launcher-up position (FIG. **5B**). In some examples, the rotation stop **110** can be further arranged so that engagement of the rotation stop **110** and the body **102** (via the first end of arcuate projection **103** in this example) substantially prevents further rotation and movement of the launcher **106** beyond the launcher-up position.

[0033] The arrow rest assembly **10** can be mounted on a riser of an archery bow in the limb-driven arrangement (as in FIGS. **4A** and **4B**, with the launcher **106** secured to the shaft **108** in the first launcher orientation). A coupling cable **20** is connected to a limb of the archery bow and coupled to the shaft **108** (through the rotation stop **110** in this example; any suitable coupling arrangement can be employed) so as to link rotation of the shaft **108** to movement of the limb. Alternatively, instead of being connected to the bow limb, the coupling cable **20** can be connected to a segment of a bow cable that moves toward the arrow rest assembly **10** when the bow is drawn, e.g., a lower segment of a let-out cable of a single-cam bow; such an arrangement is still referred to herein as limb-driven. In either case (connected to the bow limb or bow cable), with the bow at brace, tension on the coupling cable **20** holds the shaft **108** rotated in the first direction against the bias torque with the launcher **106** in the launcher-down position (as in FIG. **4A**). With the bow drawn, the coupling cable **20** is slack, and engagement of the rotation stop **110** and the body **102** holds the shaft **108** with the launcher **106** in the launcher-up position (as in FIG. **4B**).

[0034] The arrow rest assembly **10** can be mounted on a riser of an archery bow in the cable-driven arrangement (as in FIGS. **5A** and **5B**, with the launcher **106** secured to the shaft **108** in the second launcher orientation). A coupling cable **20** is connected to a segment of a bow cable that moves away from the arrow rest assembly **10** when the bow is

drawn, e.g., a lower segment of a power cable of a single-cam bow. The coupling cable **20** is coupled to the shaft **108** (through the rotation stop **110** in this example; any suitable coupling arrangement can be employed) so as to link rotation of the shaft **108** to movement of the bow cable. With the bow at brace, the coupling cable **20** is slack, and engagement of the rotation stop **110** and the body **102** holds the shaft **108** with the launcher **106** in the launcher-down position (as in FIG. **5A**). With the bow drawn, tension on the coupling cable **20** holds the shaft **108** rotated in the second direction against the bias torque with the launcher **106** in the launcher-up position (as in FIG. **5B**).

[0035] The arrow rest assembly **10** can be readily converted from the limb-driven arrangement to the cable-driven arrangement. The launcher **106** is removed from the shaft **108** and resecured to the shaft **108** in the second launcher orientation (rotated 180° around the shaft in one example; other suitable relative rotations can be employed). The coupling cable **20** is disconnected from the bow limb, or from the bow cable segment that moves toward the arrow rest assembly during draw, and is reconnected to the bow cable segment that moves away from the arrow rest assembly **10** during draw. Depending on the nature of the linkage between the coupling cable **20** and rotation of the shaft **108**, it may be necessary to rearrange that coupling. In the examples of FIGS. **4A** through **5B**, the coupling cable **20** must be connected to the other side of the rotation stop **110**. In another example, if a pivoting connection were employed, rearrangement of the connection might not be needed. In some examples it might be necessary to remove the rotation stop **110** from the shaft **108** and then resecure it. In the example of FIGS. **4A** through **5B**, the rotation stop **110** must be removed to allow rotation of the shaft from the positions of FIGS. **4A** and **4B** to the positions of FIGS. **5A** and **5B**. In some examples, the rotation stop **110** is resecured to the shaft **108** in the same position; in other examples the rotation stop **110** is resecured in a different relative orientation on the shaft **108**, to provide stops at shaft orientations different from those of the limb-driven arrangement but suitable for the cable-driven arrangement.

[0036] Likewise, the arrow rest assembly **10** can be readily converted from the cable-driven arrangement to the limb-driven arrangement. The launcher **106** is removed from the shaft **108** and resecured to the shaft **108** in the first launcher orientation (rotated 180° around the shaft in one example; other suitable relative rotations can be employed). The coupling cable **20** is disconnected from the bow cable segment that moves away from the arrow rest assembly during draw, and is reconnected to the bow limb, or to the bow cable segment that toward from the arrow rest assembly **10** during draw. Depending on the nature of the linkage between the coupling cable **20** and rotation of the shaft **108**, it may be necessary to rearrange that coupling. In the examples of FIGS. **4A** through **5B**, the coupling cable **20** must be connected to the other side of the rotation stop **110**. In another example, if a pivoting connection were employed, rearrangement of the connection might not be needed. In some examples it might be necessary to remove the rotation stop **110** from the shaft **108** and then resecure it. In the example of FIGS. **4A** through **5B**, the rotation stop **110** must be removed to allow rotation of the shaft from the positions of FIGS. **5A** and **5B** to the positions of FIGS. **4A** and **4B**. In some examples, the rotation stop **110** is resecured to the shaft **108** in the same position; in other examples the rotation

stop **110** is resecured in a different relative orientation on the shaft **108**, to provide stops at shaft orientations different from those of the cable-driven arrangement but suitable for the limb-driven arrangement.

[0037] The conversions described above can be performed with the arrow rest assembly **10** removed from the riser of the bow or while still mounted on the riser of the bow.

[0038] Any suitable mechanism can be employed for providing the bidirectional bias torque exerted on the shaft **108**. The following examples can be used alone or in any suitable combination. One well-suited example mechanism comprises a pair of diametrically magnetized annular magnets. The first annular magnet **118** is substantially non-rotatably mounted on the shaft **108** (by press-fit, adhesive, fasteners, or other suitable means) and the second annular magnet **112** is substantially non-rotatably mounted on the body **102** (by press-fit, adhesive, fasteners, or other suitable means). The shaft **108** passes through central openings of the first and second annular magnets **112/118** so that they are substantially coaxial. With the shaft **108** at the shaft reference orientation, respective magnetizations of the first and second annular magnets **112/118** are substantially antiparallel so that they exert negligible torque on each other about the axis. In the examples of FIGS. 4A through 5B (magnets not visible), the first magnet **118** is mounted on the shaft **108** with its diametrical poles substantially aligned with the “N” and “S” labels shown on the rotation stop **110**; the second magnet **112** is mounted on the body **102** with its diametrical poles substantially aligned with the “N” and “S” labels shown on the body **102**. Rotation of the shaft **108** away from the shaft reference orientation results in the first and second magnets **112/118** exerting the bias torque that opposes the rotation of the shaft **108** in both directions away from the shaft reference orientation.

[0039] Another suitable example mechanism comprises a first set of one or more magnets connected to the shaft **108** and a second set of one or more magnets mounted on the body **102**. The sets of magnets are arranged to exert negligible torque with the shaft **108** at the shaft reference orientation, and so that rotation of the shaft **108** away from the shaft reference orientation results in the sets of magnets exerting the bias torque that opposes the rotation of the shaft **108** away from the shaft reference orientation. In one such example, the entire rotation stop **110** of FIGS. 4A through 5B could be magnetized as shown, and a corresponding, antiparallel (at the reference orientation) bar magnet could be mounted on the body **102**.

[0040] Another suitable example mechanism comprises one or more linear or torsion springs coupling the shaft **108** and the body **102**. The springs are arranged to exert negligible torque on the shaft **108** at the shaft reference orientation, and so that rotation of the shaft **108** away from the shaft reference orientation results in the springs exerting the bias torque that opposes the rotation of the shaft **108** away from the shaft reference orientation. In one such example, opposing pairs of springs can be employed.

[0041] In addition to the preceding, the following examples fall within the scope of the present disclosure or appended claims:

Example 1

[0042] An arrow rest assembly for a compound archery bow, the arrow rest assembly comprising: (a) a body; (b) a shaft engaged with the body so as to rotate about an axis that,

with the arrow rest assembly secured to the riser of the archery bow, is substantially perpendicular to a shooting plane defined by the archery bow; (c) a bidirectional bias mechanism structurally arranged so as to provide a bias torque that opposes rotation of the shaft in both directions away from a single, substantially fixed shaft reference orientation relative to the body; (d) a launcher substantially non-rotatably secured to the shaft; and (e) a rotation stop substantially non-rotatably secured to the shaft, wherein: (f) the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in a launcher-up position, and (ii) rotation of the shaft, away from the reference orientation in a first direction against the bias torque, moves the launcher from the launcher-up position to a launcher-down position; or (g) the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position, and (ii) rotation of the shaft, away from the reference orientation in a second direction opposite the first direction and against the bias torque, moves the launcher from the launcher-down position to the launcher-up position.

Example 2

[0043] The arrow rest assembly of Example 1 wherein: (h) the bidirectional bias mechanism comprises a first diametrically magnetized annular magnet substantially non-rotatably mounted on the shaft and a second diametrically magnetized annular magnet substantially non-rotatably mounted on the body; (i) the shaft passes through central openings of the first and second annular magnets so that the first and second annular magnets are substantially coaxial; (j) with the shaft at the shaft reference orientation, respective magnetizations of the first and second annular magnets are substantially antiparallel so that the first and second magnets exert negligible torque on each other about the axis; and (k) rotation of the shaft away from the shaft reference orientation results in the first and second magnets exerting the bias torque that opposes the rotation of the shaft away from the shaft reference orientation.

Example 3

[0044] The arrow rest assembly of any one of Examples 1 or 2 wherein: (h) the bidirectional bias mechanism comprises a first set of one or more magnets connected to the shaft and a second set of one or more magnets mounted on the body; (i) the magnets of the first and second sets are structurally arranged so as to exert, with the shaft at the shaft reference orientation, negligible torque on the shaft about the axis; and (j) the magnets of the first and second sets are structurally arranged so that rotation of the shaft away from the shaft reference orientation results in the magnets of the first and second sets exerting the bias torque that opposes the rotation of the shaft away from the shaft reference orientation.

Example 4

[0045] The arrow rest assembly of any one of Examples 1 through 3 wherein: (h) the bidirectional bias mechanism comprises one or more linear or torsion springs coupling the shaft and the body; (i) the one or more springs are structurally arranged so as to exert, with the shaft at the shaft reference orientation, negligible torque on the shaft about

the axis; and (j) the one or more springs are structurally arranged so that rotation of the shaft away from the shaft reference orientation results in the one or more springs exerting the bias torque that opposes the rotation of the shaft away from the shaft reference orientation.

Example 5

[0046] The arrow rest assembly of Example 4 wherein the one or more linear or torsion springs comprises (i) a pair of opposed linear springs or (ii) a pair of opposed torsion springs.

Example 6

[0047] The arrow rest assembly of any one of Examples 1 through 5 further comprising a mounting bracket structurally arranged so as to secure the arrow rest assembly to a riser of the archery bow.

Example 7

[0048] The arrow rest assembly of Example 6 wherein the mounting bracket is structurally arranged so as to enable adjustment of one or more of a horizontal position or a vertical position of the arrow rest assembly relative to the riser of the archery bow.

Example 8

[0049] The arrow rest assembly of any one of Examples 1 through 7 wherein the arrow rest assembly is further structurally arranged so that: (h) engagement of the rotation stop and the body holds the shaft rotated, in the first direction, away from the reference orientation against the bias torque, with the launcher in the launcher-up position, or (i) engagement of the rotation stop and the body holds the shaft rotated, in the second direction, away from the reference orientation against the bias torque, with the launcher in the launcher-down position.

Example 9

[0050] The arrow rest assembly of any one of Examples 1 through 8 wherein: (d') the launcher is structurally arranged so as to be removably, substantially non-rotatably secured to the shaft in each one of first and second launcher orientations relative to the shaft; (f') with the launcher secured to the shaft in the first launcher orientation, the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in a launcher-up position, and (ii) rotation of the shaft, away from the reference orientation in a first direction against the bias torque, moves the launcher from the launcher-up position to a launcher-down position; and (g') with the launcher secured to the shaft in the second launcher orientation, the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position, and (ii) rotation of the shaft, away from the reference orientation in a second direction opposite the first direction and against the bias torque, moves the launcher from the launcher-down position to the launcher-up position.

Example 10

[0051] The arrow rest assembly of Example 9 wherein: (h) the rotation stop is arranged so as to be removably, substan-

tially non-rotatably secured to the shaft in each one of first and second stop orientations relative to the shaft; (i) with the launcher secured to the shaft in the first launcher orientation and the rotation stop secured to the shaft in the first stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position; and (j) with the launcher secured to the shaft in the second launcher orientation and the rotation stop secured to the shaft in the second stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position.

Example 11

[0052] The arrow rest assembly of Example 10 wherein: (k) with the launcher secured to the shaft in the first launcher orientation and the rotation stop secured to the shaft in the first stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body substantially prevents movement of the launcher beyond the launcher-down position; and (l) with the launcher secured to the shaft in the second launcher orientation and the rotation stop secured to the shaft in the second stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body substantially prevents movement of the launcher beyond the launcher-up position.

Example 12

[0053] The arrow rest assembly of any one of Examples 9 through 11 wherein: (h) the launcher is secured to the shaft in the first launcher orientation; (i) the arrow rest assembly is secured to the riser of the archery bow; (j) a coupling cable is (i) connected to a limb of the archery bow or to a segment of a cable of the archery bow that moves toward the arrow rest assembly when the bow is drawn, and (ii) coupled to the shaft so as to link rotation of the shaft to movement of the limb or movement of the cable segment that moves toward the arrow rest assembly when the bow is drawn; (k) the arrow rest assembly is further structurally arranged so that, with the bow at brace, tension on the coupling cable holds the shaft rotated in the first direction against the bias torque with the launcher in the launcher-down position; and (l) the arrow rest assembly is further structurally arranged so that, with the bow drawn, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position.

Example 13

[0054] The arrow rest assembly of Example 12 further comprising the coupling cable and the archery bow.

Example 14

[0055] A method for using the arrow rest assembly of any one of Examples 12 or 13, the method comprising: (A) removing the launcher from the shaft and resecuring the launcher to the shaft in the second launcher orientation; (B) disconnecting the coupling cable from the limb or from the cable segment that moves toward the arrow rest assembly when the bow is drawn, and reconnecting the coupling cable to a segment of a cable of the archery bow that moves away from the arrow rest assembly when the bow is drawn; and

(C) arranging, or verifying arrangement of, coupling of the coupling cable to the shaft so as to link rotation of the shaft to movement of the cable segment that moves away from the arrow rest assembly when the bow is drawn, wherein, after performing the acts of parts (A), (B), and (C): (D) the arrow rest assembly is further structurally arranged so that, with the bow at brace, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position; and (E) the arrow rest assembly is further structurally arranged so that, with the bow drawn, tension on the coupling cable holds the shaft rotated in the second direction against the bias torque with the launcher in the launcher-up position.

Example 15

[0056] The arrow rest assembly of any one of Examples 9 through 11 wherein: (h) the launcher is secured to the shaft in the second launcher orientation; (i) the arrow rest assembly is secured to the riser of the archery bow; (j) a coupling cable is (i) connected to a segment of a cable of the archery bow that moves away from the arrow rest assembly when the bow is drawn, and (ii) coupled to the shaft so as to link rotation of the shaft to movement of the cable segment that moves away from the arrow rest assembly when the bow is drawn; (k) the arrow rest assembly is further structurally arranged so that, with the bow at brace, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position; and (l) the arrow rest assembly is further structurally arranged so that, with the bow drawn, tension on the coupling cable holds the shaft rotated in the second direction against the bias torque with the launcher in the launcher-up position.

Example 16

[0057] The arrow rest assembly of Example 15 further comprising the coupling cable and the archery bow.

Example 17

[0058] A method for using the arrow rest assembly of any one of Examples 15 or 16, the method comprising: (A) removing the launcher from the shaft and resecuring the launcher to the shaft in the first launcher orientation; (B) disconnecting the coupling cable from the cable segment that moves away from the arrow rest assembly when the bow is drawn, and reconnecting the coupling cable to a limb of the archery bow or to a segment of a cable of the archery bow that toward the arrow rest assembly when the bow is drawn; and (C) arranging, or verifying arrangement of, coupling of the coupling cable to the shaft so as to link rotation of the shaft to movement of the limb or movement of the cable segment that moves toward the arrow rest assembly when the bow is drawn, wherein, after performing the acts of parts (A), (B), and (C): (D) the arrow rest assembly is further structurally arranged so that, with the bow at brace, tension on the coupling cable holds the shaft rotated in the first direction against the bias torque with the launcher in the launcher-down position; and (E) the arrow rest assembly is further structurally arranged so that, with the bow drawn, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position.

[0059] It is intended that equivalents of the disclosed example embodiments and methods shall fall within the scope of the present disclosure or appended claims. It is intended that the disclosed example embodiments and methods, and equivalents thereof, may be modified while remaining within the scope of the present disclosure or appended claims.

[0060] In the foregoing Detailed Description, various features may be grouped together in several example embodiments for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that any claimed embodiment requires more features than are expressly recited in the corresponding claim. Rather, as the appended claims reflect, inventive subject matter may lie in less than all features of a single disclosed example embodiment. Thus, the appended claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separate disclosed embodiment. However, the present disclosure shall also be construed as implicitly disclosing any embodiment having any suitable set of one or more disclosed or claimed features (i.e., a set of features that are neither incompatible nor mutually exclusive) that appear in the present disclosure or the appended claims, including those sets that may not be explicitly disclosed herein. In addition, for purposes of disclosure, each of the appended dependent claims shall be construed as if written in multiple dependent form and dependent upon all preceding claims with which it is not inconsistent. It should be further noted that the scope of the appended claims does not necessarily encompass the whole of the subject matter disclosed herein.

[0061] For purposes of the present disclosure and appended claims, the conjunction “or” is to be construed inclusively (e.g., “a dog or a cat” would be interpreted as “a dog, or a cat, or both”; e.g., “a dog, a cat, or a mouse” would be interpreted as “a dog, or a cat, or a mouse, or any two, or all three”), unless: (i) it is explicitly stated otherwise, e.g., by use of “either . . . or,” “only one of,” or similar language; or (ii) two or more of the listed alternatives are mutually exclusive within the particular context, in which case “or” would encompass only those combinations involving non-mutually-exclusive alternatives. For purposes of the present disclosure and appended claims, the words “comprising,” “including,” “having,” and variants thereof, wherever they appear, shall be construed as open ended terminology, with the same meaning as if the phrase “at least” were appended after each instance thereof, unless explicitly stated otherwise. For purposes of the present disclosure or appended claims, when terms are employed such as “about equal to,” “substantially equal to,” “greater than about,” “less than about,” and so forth, in relation to a numerical quantity, standard conventions pertaining to measurement precision and significant digits shall apply, unless a differing interpretation is explicitly set forth. For null quantities described by phrases such as “substantially prevented,” “substantially absent,” “substantially eliminated,” “about equal to zero,” “negligible,” and so forth, each such phrase shall denote the case wherein the quantity in question has been reduced or diminished to such an extent that, for practical purposes in the context of the intended operation or use of the disclosed or claimed apparatus or method, the overall behavior or performance of the apparatus or method does not differ from

that which would have occurred had the null quantity in fact been completely removed, exactly equal to zero, or otherwise exactly nulled.

[0062] In the appended claims, any labelling of elements, steps, limitations, or other portions of a claim (e.g., (a), (b), (c), etc., or (i), (ii), (iii), etc.) is only for purposes of clarity, and shall not be construed as implying any sort of ordering or precedence of the claim portions so labelled. If any such ordering or precedence is intended, it will be explicitly recited in the claim. In the appended claims, if the provisions of 35 USC §112(f) are desired to be invoked in an apparatus claim, then the word “means” will appear in that apparatus claim. If those provisions are desired to be invoked in a method claim, the words “a step for” will appear in that method claim. Conversely, if the words “means” or “a step for” do not appear in a claim, then the provisions of 35 USC §112(f) are not intended to be invoked for that claim.

[0063] If any one or more disclosures are incorporated herein by reference and such incorporated disclosures conflict in part or whole with, or differ in scope from, the present disclosure, then to the extent of conflict, broader disclosure, or broader definition of terms, the present disclosure controls. If such incorporated disclosures conflict in part or whole with one another, then to the extent of conflict, the later-dated disclosure controls.

[0064] The Abstract is provided as required as an aid to those searching for specific subject matter within the patent literature. However, the Abstract is not intended to imply that any elements, features, or limitations recited therein are necessarily encompassed by any particular claim. The scope of subject matter encompassed by each claim shall be determined by the recitation of only that claim.

What is claimed is:

1. An arrow rest assembly for a compound archery bow, the arrow rest assembly comprising:

- (a) a body;
- (b) a shaft engaged with the body so as to rotate about an axis that, with the arrow rest assembly secured to the riser of the archery bow, is substantially perpendicular to a shooting plane defined by the archery bow;
- (c) a bidirectional bias mechanism structurally arranged so as to provide a bias torque that opposes rotation of the shaft in both directions away from a single, substantially fixed shaft reference orientation relative to the body;
- (d) a launcher substantially non-rotatably secured to the shaft; and
- (e) a rotation stop substantially non-rotatably secured to the shaft,

wherein:

- (f) the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in a launcher-up position, and (ii) rotation of the shaft, away from the reference orientation in a first direction against the bias torque, moves the launcher from the launcher-up position to a launcher-down position; or
- (g) the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position, and (ii) rotation of the shaft, away from the reference orientation in a second direction opposite the

first direction and against the bias torque, moves the launcher from the launcher-down position to the launcher-up position.

2. The arrow rest assembly of claim 1 wherein the arrow rest assembly is further structurally arranged so that:

- (h) engagement of the rotation stop and the body holds the shaft rotated, in the first direction, away from the reference orientation against the bias torque, with the launcher in the launcher-up position, or
- (i) engagement of the rotation stop and the body holds the shaft rotated, in the second direction, away from the reference orientation against the bias torque, with the launcher in the launcher-down position.

3. The arrow rest assembly of claim 1 wherein:

- (d') the launcher is structurally arranged so as to be removably, substantially non-rotatably secured to the shaft in each one of first and second launcher orientations relative to the shaft;
- (f') with the launcher secured to the shaft in the first launcher orientation, the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in a launcher-up position, and (ii) rotation of the shaft, away from the reference orientation in a first direction against the bias torque, moves the launcher from the launcher-up position to a launcher-down position; and
- (g') with the launcher secured to the shaft in the second launcher orientation, the arrow rest assembly is structurally arranged so that (i) engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position, and (ii) rotation of the shaft, away from the reference orientation in a second direction opposite the first direction and against the bias torque, moves the launcher from the launcher-down position to the launcher-up position.

4. The arrow rest assembly of claim 3 wherein:

- (h) the launcher is secured to the shaft in the first launcher orientation;
- (i) the arrow rest assembly is secured to the riser of the archery bow;
- (j) a coupling cable is (i) connected to a limb of the archery bow or to a segment of a cable of the archery bow that moves toward the arrow rest assembly when the bow is drawn, and (ii) coupled to the shaft so as to link rotation of the shaft to movement of the limb or movement of the cable segment that moves toward the arrow rest assembly when the bow is drawn;
- (k) the arrow rest assembly is further structurally arranged so that, with the bow at brace, tension on the coupling cable holds the shaft rotated in the first direction against the bias torque with the launcher in the launcher-down position; and
- (l) the arrow rest assembly is further structurally arranged so that, with the bow drawn, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position.

5. The apparatus of claim 4 further comprising the coupling cable and the archery bow.

6. A method for using the arrow rest assembly of claim 4, the method comprising:

- (A) removing the launcher from the shaft and resecuring the launcher to the shaft in the second launcher orientation;

- (B) disconnecting the coupling cable from the limb or from the cable segment that moves toward the arrow rest assembly when the bow is drawn, and reconnecting the coupling cable to a segment of a cable of the archery bow that moves away from the arrow rest assembly when the bow is drawn; and
 - (C) arranging, or verifying arrangement of, coupling of the coupling cable to the shaft so as to link rotation of the shaft to movement of the cable segment that moves away from the arrow rest assembly when the bow is drawn, wherein, after performing the acts of parts (A), (B), and (C):
 - (D) the arrow rest assembly is further structurally arranged so that, with the bow at brace, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position; and
 - (E) the arrow rest assembly is further structurally arranged so that, with the bow drawn, tension on the coupling cable holds the shaft rotated in the second direction against the bias torque with the launcher in the launcher-up position.
- 7.** The arrow rest assembly of claim **3** wherein:
- (h) the launcher is secured to the shaft in the second launcher orientation;
 - (i) the arrow rest assembly is secured to the riser of the archery bow;
 - (j) a coupling cable is (i) connected to a segment of a cable of the archery bow that moves away from the arrow rest assembly when the bow is drawn, and (ii) coupled to the shaft so as to link rotation of the shaft to movement of the cable segment that moves away from the arrow rest assembly when the bow is drawn;
 - (k) the arrow rest assembly is further structurally arranged so that, with the bow at brace, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position; and
 - (l) the arrow rest assembly is further structurally arranged so that, with the bow drawn, tension on the coupling cable holds the shaft rotated in the second direction against the bias torque with the launcher in the launcher-up position.
- 8.** The apparatus of claim **7** further comprising the coupling cable and the archery bow.
- 9.** A method for using the arrow rest assembly of claim **7**, the method comprising:
- (A) removing the launcher from the shaft and resecuring the launcher to the shaft in the first launcher orientation;
 - (B) disconnecting the coupling cable from the cable segment that moves away from the arrow rest assembly when the bow is drawn, and reconnecting the coupling cable to a limb of the archery bow or to a segment of a cable of the archery bow that toward the arrow rest assembly when the bow is drawn; and
 - (C) arranging, or verifying arrangement of, coupling of the coupling cable to the shaft so as to link rotation of the shaft to movement of the limb or movement of the cable segment that moves toward the arrow rest assembly when the bow is drawn, wherein, after performing the acts of parts (A), (B), and (C):
 - (D) the arrow rest assembly is further structurally arranged so that, with the bow at brace, tension on the coupling cable holds the shaft rotated in the first direction against the bias torque with the launcher in the launcher-down position; and
 - (E) the arrow rest assembly is further structurally arranged so that, with the bow drawn, the coupling cable is slack, and engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position.
- 10.** The arrow rest assembly of claim **3** wherein:
- (h) the rotation stop is arranged so as to be removably, substantially non-rotatably secured to the shaft in each one of first and second stop orientations relative to the shaft;
 - (i) with the launcher secured to the shaft in the first launcher orientation and the rotation stop secured to the shaft in the first stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-up position; and
 - (j) with the launcher secured to the shaft in the second launcher orientation and the rotation stop secured to the shaft in the second stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body holds the shaft with the launcher in the launcher-down position.
- 11.** The arrow rest assembly of claim **10** wherein:
- (k) with the launcher secured to the shaft in the first launcher orientation and the rotation stop secured to the shaft in the first stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body substantially prevents movement of the launcher beyond the launcher-down position; and
 - (l) with the launcher secured to the shaft in the second launcher orientation and the rotation stop secured to the shaft in the second stop orientation, the arrow rest assembly is structurally arranged so that engagement of the rotation stop and the body substantially prevents movement of the launcher beyond the launcher-up position.
- 12.** The apparatus of claim **1** wherein:
- (h) the bidirectional bias mechanism comprises a first diametrically magnetized annular magnet substantially non-rotatably mounted on the shaft and a second diametrically magnetized annular magnet substantially non-rotatably mounted on the body;
 - (i) the shaft passes through central openings of the first and second annular magnets so that the first and second annular magnets are substantially coaxial;
 - (j) with the shaft at the shaft reference orientation, respective magnetizations of the first and second annular magnets are substantially antiparallel so that the first and second magnets exert negligible torque on each other about the axis; and
 - (k) rotation of the shaft away from the shaft reference orientation results in the first and second magnets exerting the bias torque that opposes the rotation of the shaft away from the shaft reference orientation.
- 13.** The apparatus of claim **1** wherein:
- (h) the bidirectional bias mechanism comprises a first set of one or more magnets connected to the shaft and a second set of one or more magnets mounted on the body;
 - (i) the magnets of the first and second sets are structurally arranged so as to exert, with the shaft at the shaft reference orientation, negligible torque on the shaft about the axis; and

- (j) the magnets of the first and second sets are structurally arranged so that rotation of the shaft away from the shaft reference orientation results in the magnets of the first and second sets exerting the bias torque that opposes the rotation of the shaft away from the shaft reference orientation.

14. The apparatus of claim **1** wherein:

- (h) the bidirectional bias mechanism comprises one or more linear or torsion springs coupling the shaft and the body;
- (i) the one or more springs are structurally arranged so as to exert, with the shaft at the shaft reference orientation, negligible torque on the shaft about the axis; and
- (j) the one or more springs are structurally arranged so that rotation of the shaft away from the shaft reference orientation results in the one or more springs exerting the bias torque that opposes the rotation of the shaft away from the shaft reference orientation.

15. The arrow rest assembly of claim **14** wherein the one or more linear or torsion springs comprises (i) a pair of opposed linear springs or (ii) a pair of opposed torsion springs.

16. The apparatus of claim **1** further comprising a mounting bracket structurally arranged so as to secure the arrow rest assembly to a riser of the archery bow.

17. The apparatus of claim **16** wherein the mounting bracket is structurally arranged so as to enable adjustment of one or more of a horizontal position or a vertical position of the arrow rest assembly relative to the riser of the archery bow.

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